REMARKS

Claims 1-2, and 5-16 were pending. Claims 1, 7, 10-12, and 14 are amended herein without prejudice and without acquiescence. Amendment to claim 1 is provided in the specification at least at page 21, lines 17-18. Amendment to claim 11 is provided in the specification at least at page 21, lines 17-18. Amendment to claim 12 is provided in the specification at least at page 21, lines 17-18 and page 15, line 25-page 16, line 11 and Figure 2. Claim 16 is canceled herein.

New claim 18 is provided herein, finding support in the specification at least at page 15, line 25-page 16, line 11. No new matter has been entered herein.

I. Issue Under 35 USC § 112, second paragraph

Claim 10 was rejected under 35 USC § 112, second paragraph for insufficient basis for the term "the R_{DS}". Applicants amend claim 10 accordingly and respectfully request withdrawal of the rejection.

II. Issue Under 35 USC § 102(b)

Claims 1, 2, 5-12, and 16 are rejected under 35 USC § 102(b) as being anticipated by Harrison *et al.* (U.S. Patent No. 6,432,290; "Harrison").

Harrison discloses on-chip sample pre-concentration by solid phase extraction (SPE), where an analyte is captured in a first column followed by elution thereof to a second column downstream of the first column. More specifically, referring to Fig. 9 and as described at col. 17, line 39-col. 18, line 7, a specific protein is isolated in a zone 25 by antibody, from which it is eluted and trapped in a downstream zone 30 where the protein is digested by an immobilized protease enzyme. The protein digest is then flushed into a trapping zone 35 further downstream that contains an SPE material allowing concentration of the digest peptides onto the bed in zone 35. The peptides are then eluted from the bed 35 to deliver concentrated protein digest to another location on the chip for final analysis.

In contrast, in the microfluidic device according to pending claim 1, a first upstream bed is provided in at least one flow path for capture of undesired substance(s), whereas a second downstream bed, which is common to all of the flow paths, is provided for specific

capture of the analyte, the second bed being provided in a detection microcavity permitting measurement on the bed.

Harrison thus fails to disclose a microfluidic device where an undesired substance or substances are captured in an upstream column. The Examiner alleges on page 3 of the Action that this is disclosed in Harrison at col. 4, lines 12-19, which states the following:

> Advantageously, unlike sample stacking, [solid phase extraction] can be made selective for a particular analyte and does not require precise control of buffer concentrations. For SPE the amount of preconcentration is limited by the preconcentration time, which makes it more flexible than sample stacking. The SPE of an analyte can be beneficial not only for analyte preconcentration, but also for removing other impurities or changing solvent conditions.

Thus, the passage only generally states that the device may be employed for removing impurities and makes no mention of "...a second porous bed II that is placed upstream of porous bed I and is dummy with respect to interaction with solute S but capable of interacting with a substance DS that is present in a liquid aliquot together with solute S and is capable of disturbing the result of the interaction between solute S and said immobilized reactant R."

Applicants respectfully request withdrawal of the rejection.

III. Issue Under 35 USC § 102(e)

Claims 1, 2, 5-9, 11-12, and 15-16 are rejected under 35 USC § 102(b) as being anticipated by Andersson *et al.* (US2003/0053934; "Andersson").

The microfluidic system disclosed in Andersson comprises (Fig. 2a) a microchannel structure comprising a reaction microcavity (204) which may comprise a solid phase carrying an immobilized reactant. The microcavity is connected to one or more inlet microconduits, each of which communicates with an inlet port, and a restriction microconduit (205) with an outlet end, which in turn communicates with an outlet port. It is to be noted that in paragraph [0017] referred to by the Examiner, the microcavity is erroneously given reference numerals "(105, 205)" instead of the correct numerals "(104, 204)", "(105, 205)" designating a restriction microconduit; cf. e.g. paragraph [0080]. That is, the restriction microconduit (205) does not contain any solid phase.

Andersson therefore fails to disclose a microfluidic device where a first, upstream bed is provided in at least one flow path for capture of undesired substance(s), whereas a second, downstream bed, which is common to all of the flow paths, is provided for specific capture of the analyte, the second bed being provided in a detection microcavity permitting measurement on the bed.

The claimed microfluidic device is therefore not anticipated by the disclosure of Andersson, and Applicants respectfully request withdrawal of the rejection.

IV. Issues Under 35 USC § 103(a)

Claims 13-15 are rejected under 35 USC § 103(a) as being unpatentable over Harrison.

Obviousness requires a suggestion of all the elements in a claim (*CFMT, Inc. v. Yieldup Int'l Corp.*, 349 F.3d 1333, 1342 [68 USPQ2d 1940] (Fed. Cir. 2003)) and "a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR Int'l Co.l v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 [82 USPQ2d 1385] (2007). As stated above in section II, the rejected claims (including claim 12 from which claims 13-15 depend) cannot be anticipated by Harrison because Harrison lacks at least one element. In addition, the claims are not obvious in light of Harrison, because the claimed elements are not suggested therein, nor would a skilled artisan have reason to combine the claimed elements in such a manner. Even given that Harrison states in passing that "The SPE of an analyte can be beneficial not only for analyte preconcentration, but also for removing other impurities…", this gives no indication, suggestion, or particular reason to configure the device such that a first upstream bed is provided in at least one flow path for capture of the undesired substance and a second downstream bed (provided in a detection microcavity permitting measurement on the bed) common to all of the flow paths is provided for specific capture of the analyte.

Applicants therefore submit that the present invention is inventive over the cited reference and respectfully request withdrawal of the rejection.

V. Conclusion

In view of the above, Applicant believes the pending application is in condition for allowance.

Applicant believes no fee is due with this response other than that submitted herewith. However, if a fee is due, please charge our Deposit Account No. 06-2375, under Order No. HO-P02936US1 from which the undersigned is authorized to draw.

Dated: September 12, 2011

Respectfully submitted,

By____/Melissa L. Sistrunk/____
Melissa L. Sistrunk, Ph.D.
Registration No.: 45,579
FULBRIGHT & JAWORSKI L.L.P.
Fulbright Tower
1301 McKinney, Suite 5100
Houston, Texas 77010-3095
(713) 651-5151
(713) 651-5246 (Fax)
Agent for Applicant